

COMPLETE LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-12 (Canceled.)

13. (Currently Amended) An electronic ballast protection and control circuit, comprising:

an end of lamp life sensing and control circuit adapted to sense an end of lamp life condition in a gas discharge lamp load connected to an electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to be capacitively coupled across an output of the electronic ballast, to sense the end of lamp life condition by sensing a peak-to-peak voltage that develops across the gas discharge lamp load when the end of lamp life condition occurs, to generate an end of lamp life control signal when the peak-to-peak voltage exceeds a predetermined end of lamp life reference voltage, and adapted to set the predetermined end of lamp

life reference voltage using an end of lamp life reference component included in the end of lamp life sensing and control circuit, and

~~The protection and control circuit of claim 12,~~ wherein the end of lamp life sensing and control circuit is adapted to sense DC rectification and excessively high AC voltage end of lamp life conditions.

14. (Currently Amended) An electronic ballast protection and control circuit, comprising:

an end of lamp life sensing and control circuit adapted to sense an end of lamp life condition in a gas discharge lamp load connected to an electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to be capacitively coupled across an output of the electronic ballast, to sense the end of lamp life condition by sensing a peak-to-peak voltage that develops across the gas discharge lamp load when the end of lamp life condition occurs, to generate an end of lamp life control signal when the peak-to-peak voltage exceeds a predetermined end of lamp life reference voltage, and adapted to set the predetermined end of lamp life reference voltage using an end of lamp life reference component included in the end of lamp life sensing and control circuit, and

~~The protection and control circuit of claim 12, wherein the end of lamp life sensing and control circuit is adapted to be connected in parallel with the gas discharge lamp load.~~

15. (Currently Amended) An electronic ballast protection and control circuit, comprising:

an end of lamp life sensing and control circuit adapted to sense an end of lamp life condition in a gas discharge lamp load connected to an electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to be capacitively coupled across an output of the electronic ballast, to sense the end of lamp life condition by sensing a peak-to-peak voltage that develops across the gas discharge lamp load when the end of lamp life condition occurs, to generate an end of lamp life control signal when the peak-to-peak voltage exceeds a predetermined end of lamp life reference voltage, and adapted to set the predetermined end of lamp life reference voltage using an end of lamp life reference component included in the end of lamp life sensing and control circuit, and

~~The protection and control circuit of claim 12, wherein the end of lamp life sensing and control circuit is adapted so that current flowing through the sensing circuit is less than current flowing through the gas discharge lamp load.~~

16. (Currently Amended) An electronic ballast protection and control circuit, comprising:

an end of lamp life sensing and control circuit adapted to sense an end of lamp life condition in a gas discharge lamp load connected to an electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to be capacitively coupled across an output of the electronic ballast, to sense the end of lamp life condition by sensing a peak-to-peak voltage that develops across the gas discharge lamp load when the end of lamp life condition occurs, to generate an end of lamp life control signal when the peak-to-peak voltage exceeds a predetermined end of lamp life reference voltage, and adapted to set the predetermined end of lamp life reference voltage using an end of lamp life reference component included in the end of lamp life sensing and control circuit, and

~~The protection and control circuit of claim 12,~~ wherein the end of lamp life sensing and control circuit includes an AC sensing component adapted to sense AC voltage developed across the gas discharge lamp load.

17. (Currently Amended) An electronic ballast protection and control circuit, comprising:

an end of lamp life sensing and control circuit adapted to sense an end of lamp life condition in a gas discharge lamp load connected to an electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to be capacitively coupled across an output of the electronic ballast, to sense the end of lamp life condition by sensing a peak-to-peak voltage that develops across the gas discharge lamp load when the end of lamp life condition occurs, to generate an end of lamp life control signal when the peak-to-peak voltage exceeds a predetermined end of lamp life reference voltage, and adapted to set the predetermined end of lamp life reference voltage using an end of lamp life reference component included in the end of lamp life sensing and control circuit, and

~~The protection and control circuit of claim 12,~~ wherein the end of lamp life sensing and control circuit is further adapted to sense an overheating condition in the electronic ballast and to cause the electronic ballast to enter an overheating protected state when the overheating condition occurs.

18. (Canceled).

19. (Currently Amended) A protection and control circuit for an electronic ballast, comprising:

an end of lamp life sensing and control circuit adapted to be capacitively coupled across an output of the electronic ballast, to sense an end of lamp life condition in a gas discharge lamp load connected to the electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to generate an end of lamp life control signal that is used to cause the electronic ballast to enter the end of lamp life protected state,

wherein the end of lamp life sensing and control circuit is adapted to generate the end of lamp life control signal when a DC end of lamp life reference voltage generated by the end of lamp life sensing and control circuit exceeds a predetermined DC end of lamp life reference voltage, and

~~The protection and control circuit of claim 18,~~ wherein the end of lamp life sensing and control circuit is adapted to generate the DC end of lamp life reference voltage by generating an AC end of lamp life reference voltage representative of a peak-to-peak voltage across the gas discharge lamp load and converting the AC end of lamp life reference voltage into the DC end of lamp life reference voltage.

20. (Original) The protection and control circuit of claim 19, wherein the end of lamp life sensing and control circuit is adapted to generate the AC end of lamp life reference voltage by dividing the peak-to-peak voltage across the gas discharge lamp load using a voltage divider network.

21. (Original) The protection and control circuit of claim 19, wherein the end of lamp life sensing and control circuit is adapted to convert the AC end of lamp life reference voltage into the DC end of lamp life reference voltage by:

rectifying the AC end of lamp life reference voltage to generate an end of lamp life charging current; and

charging a rectifier circuit capacitor using the end of lamp life charging current to generate the DC end of lamp life reference voltage.

22. (Currently Amended) A protection and control circuit for an electronic ballast, comprising:

an end of lamp life sensing and control circuit adapted to be capacitively coupled across an output of the electronic ballast, to sense an end of lamp life condition in a gas discharge lamp load connected to the electronic ballast and to cause the electronic ballast to enter an end of lamp life protected state when the end of lamp life condition occurs,

wherein the end of lamp life sensing and control circuit is adapted to generate an end of lamp life control signal that is used to cause the electronic ballast to enter the end of lamp life protected state,

wherein the end of lamp life sensing and control circuit is adapted to generate the end of lamp life control signal when a DC end of lamp life reference voltage generated by the end of lamp life sensing and control circuit exceeds a predetermined DC end of lamp life reference voltage, and

~~The protection and control circuit of claim 18,~~ wherein the end of lamp life sensing and control circuit is adapted to determine that the DC end of lamp life reference voltage exceeds the predetermined DC end of lamp life reference voltage by:

applying the DC end of lamp life reference voltage to an end of lamp life voltage controlled switch included in the end of lamp life sensing and control circuit; and

wherein the end of lamp life voltage controlled switch includes an end of lamp life switching voltage that is equal to the predetermined DC end of lamp life reference voltage.

23. (Original) The protection and control circuit of claim 22, wherein the end of lamp life sensing and control circuit is adapted to generate the end of lamp life control signal when the end of lamp life switching voltage of the end of lamp life voltage controlled switch is exceeded by the DC end of lamp life reference voltage.

24. (Original) The protection and control circuit of claim 22, wherein the end of lamp life voltage controlled switch is a Zener diode.

25-65. (Canceled).